

WE CLAIM AS OUR INVENTION:

1. A magnetic resonance antenna having a longitudinal axis, comprising:
a birdcage structure having a longitudinal axis and having an eigen-resonance frequency, said birdcage structure comprising a plurality of parallel, longitudinal antenna rods, each having opposite ends, and antenna ferrules respectively at said opposite ends of said longitudinal antenna rods connected to said longitudinal antenna rods in terms of radio-frequency;
a plurality of radio-frequency switching elements respectively connected to said antenna rods for, when switched, interrupting the respective antenna rods in terms of radio-frequency for detuning said eigen-resonance frequency with respect to an operating magnetic resonance frequency; and
two switching lines connected in common to said radio-frequency switching elements from an exterior of said birdcage structure, each switching line comprising a ring line disposed annularly with respect to said birdcage structure and transversely to said longitudinal antenna rod.
2. A magnetic resonance antenna as claimed in claim 1 wherein said longitudinal antenna rods define a cylindrical surface, and wherein each ring line proceeds annularly in said cylindrical surface.
3. A magnetic resonance antenna as claimed in claim 1 wherein said longitudinal antenna rods define a cylindrical surface, and wherein each ring line proceeds annularly on said cylindrical surface.
4. A magnetic resonance antenna as claimed in claim 1 wherein at least one of said ring lines has a galvanic interruption therein.

5. A magnetic resonance antenna as claimed in claim 4 wherein said galvanic interruption comprises, in each ring line, a capacitive element connected in that ring line.

6. A magnetic resonance antenna as claimed in claim 1 wherein each switching line further comprises a feeder connected to the ring line thereof, each feeder proceeding from an end face of said birdcage structure and being disposed parallel to said longitudinal antenna rods.

7. A magnetic resonance antenna as claimed in claim 1 wherein each of said longitudinal antenna rods has a geometric center between the ferrules, and wherein, in each longitudinal antenna rod, the switching element thereof is disposed at a location at least approximately coinciding with said geometric center.

8. A magnetic resonance antenna as claimed in claim 1 wherein each of said radio-frequency switching elements is connected to the respective ring lines by a connection from the respective longitudinal antenna rod.

9. A magnetic resonance antenna as claimed in claim 6 wherein each of said ring lines has a geometric center between said ferrules, and wherein at least one of said ring lines is connected to the respective longitudinal antenna rods at respective locations at least approximately coinciding with the respective geometric centers.

10. A magnetic resonance antenna as claimed in claim 1 wherein the respective radio-frequency switching elements are connected to the respective ring lines via a component forming an ohmic resistance.

11. A magnetic resonance antenna as claimed in claim 1 wherein the respective radio-frequency switching elements are connected to the respective ring lines via at least one inductive element.

12. A magnetic resonance antenna as claimed in claim 11 wherein each inductive element comprises a coil.

13. A magnetic resonance antenna as claimed in claim 12 for use in a basic magnetic field having a basic magnetic field direction, and wherein each of said coils generates a coil magnetic field having a coil magnetic field direction, and wherein each of said coils is physically disposed with said coil magnetic field direction perpendicular to said basic magnetic field direction.

14. A magnetic resonance antenna as claimed in claim 12 wherein the respective radio-frequency switching elements are connected to the respective ring lines via a pair of coils connected anti-parallel.

15. A magnetic resonance antenna as claimed in claim 1 wherein the respective longitudinal antenna rods are connected to the respective ring lines via at least one inductive element.

16. A magnetic resonance antenna as claimed in claim 15 wherein each inductive element comprises a coil.

17. A magnetic resonance antenna as claimed in claim 16 for use in a basic magnetic field having a basic magnetic field direction, and wherein each of said coils generates a coil magnetic field having a coil magnetic field direction, and wherein each of said coils is physically disposed with said coil magnetic field direction perpendicular to said basic magnetic field direction.

18. A magnetic resonance antenna as claimed in claim 12 wherein the respective longitudinal antenna rods are connected to the respective ring lines via a pair of coils connected anti-parallel.

19. A magnetic resonance antenna as claimed in claim 1 wherein each of said switching lines is disposed at a same longitudinal position between said antenna ferrules and proceed annularly coaxially on respectively different radii relative to said birdcage structure.

20. A magnetic resonance antenna as claimed in claim 1 wherein each of said radio-frequency switching elements is a radio-frequency switching diode.

21. A magnetic resonance antenna as claimed in claim 20 wherein each of said radio-frequency switching diodes has an anode connected to one of said ring lines and a cathode connected to the other of said ring lines.

22. A magnetic resonance antenna as claimed in claim 1 comprising a low-pass filter connected at an input side of at least one of said switching lines.

23. A method for detuning an eigen-resonance frequency of a magnetic resonance antenna having a birdcage structure with a longitudinal axis formed by a plurality of parallel, longitudinal antenna rods and antenna ferrules respectively connected at opposite ends of said antenna rods in terms of radio-frequency comprising the steps of:

interrupting at least one part of each of said longitudinal antenna rods in terms of radio-frequency with a radio-frequency switching elements;

switching the respective radio-frequency switching elements in common via two switching lines connected to the respective radio-frequency switching elements from an exterior of the birdcage structure; and

forming each of said switching lines with a ring line proceeding annularly relative to said birdcage structure and transversely to said longitudinal antenna rods.

24. A method as claimed in claim 23 wherein each of said longitudinal antenna rods has a geometric center between said ferrules, and comprising interrupting each of said longitudinal antenna rods in terms of radio-frequency at a location at least approximately coinciding with said geometric center.